

55. **(Amended)** The system of claim 21, further comprising a detection system having a field of view extending into each of said conduits, and adapted to sense the presence or absence of a bead on said substrate under each of said second openings.

56. **(Amended)** The system of claim 55, wherein said detection system further comprises:
a radiation source adapted to illuminate said substrate at locations below each of said second openings; and
a plurality of elongated light-conductive fibers, each fiber having (i) one end disposed to receive light traveling up through a respective conduit, and (ii) a second end that communicates with a camera device.

57. **(Amended)** The system of claim 21, further comprising a support structure, wherein said first openings are disposed in an array along one side of said support structure, and said second openings are disposed in an array along an opposite side of said support structure, wherein said first-opening array is arranged with a center-to-center pitch larger than that of said second-opening array, and wherein a region of each conduit extending from a respective one of said second openings is of capillary size, such that a liquid placed in contact with said second-opening array can be drawn at least partially into said conduits by way of capillary action.

REMARKS

Entry of this amendment after final and reconsideration and allowance of the above-captioned patent application are respectfully requested. Claims 21-24, 51, and 54-57 have been amended. Claims 1-25 and 48-62 are pending. No new matter or new issues have been raised.

REQUEST FOR RECONSIDERATION OF THE FINAL REJECTION AS PREMATURE

Applicants respectfully request reconsideration of the final rejection as premature because the Examiner has introduced a new ground of rejection of the claims that

was neither necessitated by Applicant's amendments nor based on information submitted in an information disclosure statement filed during the period set forth in 37 CFR 1.97(c) with the fee set forth in 37 CFR 1.17(p). The final rejection of the claims under 35 U.S.C. §§102(b) and 103(a) is based on a new prior art reference (Eck). Applicants would like to refer the Examiner to MPEP 706.07, which states "[t]he examiner should never lose sight of the fact that in every case the applicant is entitled to a full and fair hearing and that a clear issue between applicant and examiner should be developed, if possible, before appeal." In the present case, the Examiner has switched from one set of references to another in rejecting claims of substantially the same subject matter, in successive actions. If the final rejection stands, this will tend to defeat attaining the goal of reaching a clearly defined issue for an early termination, i.e., either allowance of the case or a final rejection. Accordingly, Applicants request reconsideration and withdrawal of the outstanding final rejection and reconsideration of the present application based on the amendments and remarks contained herein.

Appeal Certain
regions defined
a surface
extending inwardly
from said side wall
was new

Claim Rejections - 35 U.S.C. §112

In the Office Action, claims 21-25 and 51-59 have been rejected under 35 U.S.C. 112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention.

Applicants disagree with the Examiner's allegations that the terms "large" and "small" are relative terms which render the claim indefinite, because these terms are defined by the claim, the specification includes a standard for ascertaining the requisite degree, and one of ordinary skill in the art would be reasonably apprised of the scope of the invention. The fact that claim language, including terms of degree, may not be precise, does not automatically render the claim indefinite under 35 U.S.C. 112, second paragraph. *Seattle Box Co., v. Industrial Crating & Packing, Inc.*, 731 F.2d 818, 221 USPQ 568 (Fed Cir. 1984). Acceptability of the claim language depends on whether one of ordinary skill in the art would understand what is claimed, in light of the specification. (MPEP §2173.05(b)).

The conduit assembly of claims 21-25 and 51-59 is described as having a plurality of conduits for separately channeling a plurality of submillimeter beads from the

cavities to desired locations on a substrate. The conduits are further described in one embodiment as having “large” openings at their upper ends and “small” openings at their lower ends. The terms “large” and “small” are used to describe the relationship between the upper openings and the lower openings of the conduit assembly, respectively. (See, for example, page 33, line 30 through page 34, line 19, etc.). It is respectfully submitted that there is nothing ambiguous about the use of the term “small” and “large” in claims 21-25 and 51-59 and that one of ordinary skill in the art would understand that when a conduit assembly is utilized, it may be advantageous to have each conduit having first or upper openings that are “large” relative to second or lower opening that are “small”. (See specification, page 34, lines 12-14).

The use of the terms “large” and “small,” when viewed in light of its plain and ordinary meaning, and as used in the specification, would clearly and distinctly convey to one skilled in the art the relationship between the recited structure. Again, the terms “large” and “small” are used throughout the specification (see, for example, specification page 20, line 30 through page 21, line 4; page 22, lines 22-33; page 33 line 30 through page 34, line 19; page 35, lines 4-27, etc.). Therefore, Applicants submit that one of ordinary skill in the art would understand what is claimed by the recited terms “large” and “small” when viewed in light of the plain and ordinary meaning of those terms and in light of the specification.

However, in an attempt to move the status of this application along, Applicants have amended claims 21-24, 51, and 54-57 to change the term “large” to “first” and the term “small” to “second.” Accordingly, withdrawal of this rejection is requested.

Claim Rejection - 35 U.S.C. §102

In the Office Action, claims 1, 3, 6, 7, and 14-17 stand rejected under 35 U.S.C. §102(b) as allegedly being anticipated by Eck (U.S. Patent no. 4,685,480). This rejection is traversed because Eck fails to disclose one or more features claimed in claims 1, 3, 6, 7, and 14-17 of the present application and therefore there can be no anticipation under 35 U.S.C. §102(b).

Eck discloses a combined washer and aspirator that reduces the amount of manual dexterity required of a laboratory technologist to wash beads in reaction wells that

are used in diagnostic immunoassays. However, Eck does not disclose an apparatus capable of picking up a plurality of submillimeter beads from a bead supply and transferring the beads to a desired location. As disclosed by Eck, the lower portions of the inner tubular members 22 comprise improved tips 46 which mate with the reaction well seals 42, tip seals 34, and outer tubular members 20. As best shown in Figure 3, each tip 46 has tip grooves 48, a cylindrical portion 50, a skirt 52, positioning means 54, deflecting means 56n a recessed portion 58, and protrusions 60. (Eck at col. 2, lns. 45-51 and Figures 1, 3, and 4).

in preamble

In contrast to the claims of the present application, the device disclosed by Eck is for washing the wells 68 of a reaction tray 70 and beads 72 contained within the reaction tray 70 and is not capable of picking up the beads from the individual wells of the reaction tray nor is the device disclosed by Eck capable of transferring the beads from the reaction trays to another desired location. The protrusions 60 of tip 46 of the Eck device act to hold beads 72 in a spaced manner away from the tips 46 to allow a flow of wash solution around the beads 72, thereby allowing the wells 68 and the beads 72 to be washed in place without removing the beads from the wells of the reaction tray. Protrusions 60 are required in the wash and aspiration device disclosed by Eck in order for the device to work properly as a wash and aspiration device. Protrusions 60 prevent the beads from fully entering the tip 46 and help to maintain a fluid passageway between the tip and the bead.

In Eck, a technologist initiates a wash cycle by placing the improved wash and aspiration device 10 over a reaction tray 70 and then activating a flow of wash solution into parallel fluid passage 12, while at the same time, parallel passage 14 and inner concentric fluid passage 18 are connected to a vacuum source for the aspiration of the fluid wash solution out of the well 68 of the reaction tray 70.

Accordingly, Eck does not disclose or teach *a system for picking up a plurality of submillimeter beads from a bead supply and transferring the beads to a desired location, as recited in claims 1 of the present application. Also, Eck does not disclose or teach a cavity formed at a lower end region of each of said projections, each of said cavities defined by (i) a lower opening, (ii) an upper ceiling region, and (iii) a sidewall extending between said lower opening and said upper ceiling region; wherein said upper ceiling region defines a surface extending inwardly from said sidewall, as recited in claims 1 of the present application.*

The Vacuum Source is effective to draw beads into cavity for aspiration see Fig 3

Furthermore, Eck does not disclose or teach *an attraction source, operable at said projection end regions, effective to draw beads from said supply into said cavities and to releasably retain said beads therein*, as recited in claims 1 of the present application. Therefore, it is submitted that Eck does not anticipate the system recited in claim 1 of the present application and withdrawal of this rejection is requested.

With respect to claims 3, 6, 7, and 14-17, these claims all depend from claim 1 and therefore, it is respectfully submitted that these claims are also not anticipated by Eck and withdrawal of this rejection is requested.

In addition, with respect to claim 3, Eck does not disclose or teach *a cavity having a substantially constant sidewall along a region extending between its lower opening and its upper ceiling region, such that lines extending longitudinally along confronting inner surfaces of each sidewall are substantially parallel to one another*, as recited in claim 3 of the present application. For this additional reason, withdrawal of the rejection of claim 3 is requested.

In addition, with respect to claim 6, Eck does not disclose or teach *a cavity dimensioned to receive at least half of one submillimeter bead, and to preclude entry therein of a substantial portion of a second such bead*, as recited in claim 6 of the present application. For this additional reason, withdrawal of the rejection of claim 6 is requested.

In addition, with respect to claim 14, Eck does not disclose or teach *a cavity formed by a resilient flexible, tubular material sleeve fit over the end of a respective projection, the sleeve having an overhang region extending below a terminal end of the projection defining the sidewall, and wherein the terminal end of the projection, facing the cavity, defines the upper ceiling region of the cavity*, as recited in claim 14 of the present application. For this additional reason, withdrawal of the rejection of claim 14 is requested.

In addition, with respect to claim 15, Eck does not disclose or teach a system wherein each of the projection is *a capillary tube having an axial lumen extending therethrough, each lumen having (i) a first end that opens into a respective one of the cavities through the ceiling region, and (ii) a second end disposed in fluid communication with a pressure-control assembly*, as recited in claim 15 of the present application. Eck does disclose a pressure source 12 for feeding wash solution into the tip 46, however, the pressure

source is in fluid communication through channels 62, 64, and 66 with the lower opening of the tip and not through a ceiling region, as recited in claim 15 of the present application. For this additional reason, withdrawal of the rejection of claim 15 is requested.

In addition, with respect to claim 16, Eck does not disclose or teach a system wherein each of the pressure-control assembly includes . . . (ii) *a pump operable to establish an increased pressure within each of said lumens, said increased pressure effective to displace any beads retained in the cavities*, as recited in claim 16 of the present application. Again, although Eck does disclose a pressure source 12 for feeding wash solution into the tip 46, the pressure source is in fluid communication through channels 62, 64, and 66 with the lower opening of the tip and therefore act to hold the bead in the tip and does not act to displace any beads retained in the tip, as recited in claim 16 of the present application. For this additional reason, withdrawal of the rejection of claim 16 is requested.

Claim Rejection - 35 U.S.C. §103

1. In the Office Action, claims 2, 4, 5, 8, 9, and 11-18 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Eck in view of Ikeda et al. (JP 64-80862) or Sakai et al. (U.S. Patent no. 4,937,048). This rejection is traversed.

Eck is described in detail above. As discussed above, Eck fails to disclose all of the features recited in claim 1. Claims 2, 4, 5, 8, 9, and 11-18 each depends, either directly or indirectly, from claim 1. For this reason alone, it is respectfully submitted that claims 2, 4, 5, 8, 9, and 11-18 are allowable over Eck in view of Ikeda et al. or Sakai et al.

In addition, as admitted by the Examiner in the Office Action, Eck does not specifically recite the sidewall of each projection comprises a resiliently flexible material.

The Examiner states in the Office Action “[i]t would have been obvious to one of ordinary skill in the art at the time the invention was made to have included in the bead dispensing system of Eck[, a] flexible cavity region, as taught by Sakai et al., in order to allow for greater contact between the lower end region of the projection supplying the suction source and the bead, thereby lowering the chance of dropping the bead prematurely. Moreover, would have been obvious to one of ordinary skill in the art at the time the invention was made to have made the sidewalls of the cavity from a flexible material, since it

has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use in a matter of obvious design choice.”

The Ikeda et al. reference does not cure the deficiencies of the Eck reference. Ikeda et al. disclose a method for moving spherical carrier for antigen-antibody reaction. The method taught by Ikeda et al. functions to prevent contamination by a cleaning liquid that co-exists with a bead by striking a spherical carrier (e.g., the bead) against a sidewall of a vessel and dislodging the carrier while maintaining a negative pressure in a suction nozzle at the time of the dropping of the spherical carrier attracted to the tip of the suction nozzle into another vessel. The dropping of the cleaning fluid remaining in the nozzle is prevented by maintaining a negative pressure state in the nozzle.

As disclosed and taught by Ikeda et al., a bead 6, which co-exists with a cleaning liquid is taken out and held attached to a suction nozzle 2. The bead 6 is then moved to above another vessel 5 and is inserted into position where the spherical center 6a of the bead 6 enters the inside of the vessel 5 from the top end 5a and the tip 2a of the nozzle 2 does not come into contact with the top end 5a of the vessel 5.

Ikeda et al. disclose and teach several embodiments, including several embodiments that do not include a cavity formed at a lower end region of the projection (see Figures 1, 2, 3, 4(2), 4(3), and 5) and one embodiment that has a flared tip 2a on nozzle 2. However, the flared tip 2a of Ikeda et al. does not include a sidewall of each projection that comprises a resiliently flexible material, as recited in claim 2 of the present application. Also, Ikeda et al. do not disclose or teach a plurality of ampules for containing the bead supply or a plurality of covers for the ampules, as recited in claims 8 and 9 of the present application. Ikeda et al. also does not disclose or teach a resiliently flexible, tubular sleeve, as recited in claim 14.

The Sakai et al. reference does not cure the deficiencies of the Eck reference. Sakai et al. disclose a carrier transporting apparatus and carrier container for use in an immunological analysis. In one embodiment, shown and described with reference to Figure 13 of Sakai et al., the carrier transporting apparatus comprises a hopper 213 for holding a number of carriers 212. A suction nozzle 218 having an elastic mouth portion 217 is arranged movably between the carrier suction position in the carrier container 211. The

suction nozzle 218 is moved to the carrier suction position through the vertical duct 215, so that the elastic mouth portion 217 is brought into contact with the carrier 212.

With respect to claims 2, 12, and 13, Eck, Ikeda et al., and Sakai et al. do not disclose or teach a plurality of projections having a cavity formed at a lower end region of each projection wherein “at least a lower portion of said sidewall of each projection comprises a resiliently flexible material, such that said flexible lower portion of said sidewall can bend while maintaining the shape of the cavity so that said lower opening can bend to face said beads in said bead supply,” as recited in claim 2 (and claims 12 and 13 which depend from claim 2).

With respect to claims 4 and 5, Eck, Ikeda et al., and Sakai et al. do not teach or suggest the relationship between the dimensions of the diameter of the lower opening the longitudinal length of the sidewall. In fact, although Ikeda et al. show a flared tip 2a and Sakai et al. show an elastic mouth portion, these references do not show varying dimensions of this feature in any of the figures and also does not mention this feature at all in the abstract/constitution or specification and therefore, it is respectfully submitted that Ikeda et al. and Sakai et al. do not teach the features recited in claims 4 and 5 of the present application.

With respect to claims 8, 9 and 11, these claim all depend from amended claim 1, which is non-obvious over the art of record for the reasons stated above. Accordingly, these claims are also non-obvious over the art of record.

With respect to claim 14, Ikeda et al. and Sakai et al. do not teach or suggest a system wherein “said cavity is formed by a resiliently flexible, tubular sleeve fit over the end of a respective projection . . .,” as recited in claim 14. Eck also does not teach or suggest this feature.

With respect to claims 15-18, Eck, Ikeda et al., and Sakai et al. do not teach or suggest a system wherein “each of said projections is a capillary tube having an axial lumen extending therethrough, each lumen having (i) a first end that opens into a respective one of said cavities through said ceiling region, and (ii) a second end disposed in fluid communication with a pressure-control assembly,” as recited in claims 15-18.

Accordingly, it is respectfully submitted that the bead dispensing system described in the specification and recited in the pending claims of the present invention is not disclosed, taught, or suggested by the cited art taken either alone or in combination, and that, therefore, the present invention would not have been obvious, based on the disclosure and teachings of Eck, Ikeda et al. and/or Sakai et al. Accordingly, withdrawal of the rejection of claims 2, 4, 5, 8, 9, and 11-18 under 35 U.S.C. §103(a) is requested.

2. In the Office Action, claim 10 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Eck in view of Sakai et al., as applied to claim 1 above, and further in view of Ekenberg et al. (U.S. Patent no. 5,272,510). This rejection is traversed.

Eck and Sakai et al. are described in detail above. As discussed above, Eck and Sakai et al. fail to disclose all of the features recited in claim 1. Claim 10 depends indirectly from claim 1. For this reason alone, it is respectfully submitted that claim 10 is allowable over Eck in view of Sakai et al, as applied to claim 1 above, and further in view of Ekenberg et al.

In addition, as admitted by the Examiner in the Office Action, Eck and Sakai et al. do not specifically disclose or teach a support which is held by a frame that is adapted to pivot about a vertical axis, rendering movable the projection array along a generally arcuate or circular pathway, and adapted for reciprocal linear motion along a generally vertical pathway.

The Ekenberg et al. reference does not cure the deficiencies of the Eck and Sakai et al. references. Ekenberg et al. disclose a multi-sample magnetic separation device 20. As described in Ekenberg et al., the apparatus and method provide for separating magnetically responsive particles from a nonmagnetic test medium in which the magnetically responsive particles are suspended. The separator 20 comprises a container 24 (e.g., a plurality of multi-well chambers) which hold the nonmagnetic test medium, one or more pins 28 disposed substantially within the test medium, an element or pin plate 30 for holding the containers, and an external magnet 34 for producing a magnetic field within the test medium. The external magnet is proximate the pins so as to create magnetic flux lines, magnetizing the pins and creating a magnetic field substantially parallel to the longitudinal axis of the pins

thereof in the test medium. The container holding the test medium is positioned in the separator, producing a magnetic field operative to cause the magnetically responsive particles to be attracted to and adhere to the pins and which is substantially parallel thereto. The nonmagnetic test medium is separated from the magnetized particles, which may conveniently be washed while adhered to the pins, and subjected to further analysis, preferably while on the pins. The apparatus is useful in separating various target substances from test media by means of substances coated on the magnetic particles which bind specifically to the target substance.

Ekenberg et al. disclose a pin plate 30 that supports the pins 28 in a fixed position and also serves as a cover for the open tops of containers 24. (See col. 8, lines 66-67). As shown in Figure 2 and 7, end 54 of pin plate 30 is hingedly attached to base 32. End 64 of base 32 has two hinges 74a and 74b, disposed on opposite sides of end 64 for plate 30. End 54 of plate 30 has a pair of opposing pins or rods 82a and 82b extending from each side of plate 30. Channels 80 of base 32 receive rods 82a and 82b of plate 30 completing the hinges 74a and 74b. (See col. 9, lines 8-31). In operation, the magnetic pack 34 is placed on top of pin plate 30 and one end 44 of the pins 28 are immersed in the test medium 26 by rotating pin plate 30 about a horizontal axis of hinges 74a and 74b.

Contrary to the assertion by the Examiner in the Office Action, Ekenberg et al. do not disclose or teach a system wherein “*said support is held by a frame that is (i) adapted to pivot about a substantially vertical axis, rendering movable said projection array along a substantially arcuate or circular pathway; and (ii) adapted for reciprocal linear motion along a substantially vertical pathway; such movement permitting said projections to be aligned with said ampule array and lowered so that each projection can enter a respective one of said ampules,*” as recited in claim 10. None of the Eck, Sakai et al., or Ekenberg et al. references disclose or teach any such feature. Accordingly, withdrawal of this rejection under 35 U.S.C. §103(a) is requested for this additional reason.

3. In the Office Action, claims 19, 20, and 48-50 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Eck in view of Sakai et al., as applied to claim 1 above, and further in view of Hassler et al. (WO 97/38318). This rejection is traversed.

Eck and Sakai et al. are described in detail above. As discussed above, Eck and Sakai et al. fail to disclose all of the features recited in claim 1. Claims 19, 20, and 48-50 depend, either directly or indirectly, from claim 1. Therefore, it is respectfully submitted that claims 19, 20 and 48-50 are allowable over Eck in view of Sakai et al, as applied to claim 1 above, and further in view of Hassler et al. Accordingly, withdrawal of this rejection is requested.

4. In the Office Action, claims 21-25, 55, and 57-59 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Eck in view of Sakai et al., as applied to claim 1 above, and further in view of Kambara et al. (U.S. Patent no. 6,288,220). This rejection is traversed.

Eck and Sakai et al. are described in detail above. As discussed above, Eck and Sakai et al. fail to disclose all of the features recited in claim 1. Claims 21-25, 55, and 57-59 depend, either directly or indirectly, from claim 1. Accordingly, it is respectfully submitted that claims 21-25, 55, and 57-59 are allowable over Eck in view of Sakai et al, as applied to claim 1 above, and further in view of Kambara et al., and therefore, withdrawal of this rejection is requested.

5. In the Office Action, claim 21-24, 51, 54, and 57-59 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Eck in view of Sakai et al., as applied to claim 1 above, and further in view of Carre et al. (EP 955 084 A1). This rejection is traversed.

Claims 21-24, 51, 54, and 57-59 depend from claim 1, which for the reasons stated above is non-obvious over the art of record. Therefore, it is respectfully submitted that claims 21-24, 51, 54, and 57-59 are also non-obvious because they depend from claim 1. Accordingly, withdrawal of the rejection of claims 21-24, 51, 54, and 57-59 under 35 U.S.C. §103(a) is requested.

In addition, Carre et al. do not disclose or teach “*a pair of spaced apart indexing holes, each being aligned with a respective indexing pin depending from a lower side of said conduit array,*” as recited in claim 54 of the present application. For this

additional reason, it is respectfully submitted that claim 54 is not obvious and withdrawal of this rejection is requested.

6. In the Office Action, claims 21 and 52 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Eck in view of Sakai et al., as applied to claim 1 above, and further in view of Gilford et al. (U.S. Patent no. 4,236,825). This rejection is traversed.

Claims 21 and 52 depend from claim 1 which for the reasons stated above is believed to be non-obvious over the art of record. Accordingly, it is respectfully submitted that claims 21 and 52 are also non-obvious because they depend from amended claim 1. Accordingly, withdrawal of this rejection is requested.

7. In the Office Action, claims 60-62 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Eck in view of Sakai et al., as applied to claim 1 above, and further in view of Gorlich et al. (U.S. Patent no. 5,447,736). This rejection is traversed.

Claims 60-62 depend from claim 1 which for the reasons stated above is believed to be non-obvious over the art of record. Accordingly, it is respectfully submitted that claims 60-62 are also non-obvious because they depend from claim 1.

Furthermore, Gorlich et al. do not teach or suggest the invention of claims 60-62 for the following additional reasons. Gorlich et al. disclose a method of packaging a food product employing a tray having side walls defining a cavity in an outwardly directed flange extending around the perimeter of the tray, the flange being adapted to receive a pair of membranes to enclose the tray. As shown and described by Gorlich et al., each membrane 14, 16 is unwound from a pair of rolls 30, 32 and 36, 38, respectively. Accordingly, as taught by Gorlich et al. there is no take-up position.

In contrast, the invention of the present application claims a covering system for covering said beads after said beads have been disposed at said desired locations on a substrate, wherein said desired locations comprise an array of wells formed in said substrate. The covering system comprises *“a continuous web of a cover material mounted for movement from a supply position to a take-up position; a shearing blade mounted for reciprocal linear motion along a direction substantially normal to said web for cutting a*

portion of said cover material at a region between said supply position and said take-up position,” as recited in claim 60. Therefore, it is submitted that claim 60 is not obvious in view of the cited prior art (nor are claims 61 and 62 which depend from claim 60).

Accordingly, it is respectfully submitted that the bead dispensing system described in the specification and recited in the pending claims of the present invention, are not disclosed nor taught, either alone or in combination, and that, therefore, the present invention would not have been obvious, based on the disclosure and teachings of Eck, Sakai et al., and/or Gorlich et al. Accordingly, for these additional reasons withdrawal of the rejection of claims 60-62 under 35 U.S.C. §103(a) is requested.

Allowable Subject Matter

The Final Rejection indicated that claims 53 and 56 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. §112, second paragraph, set forth in the Office Action and to include all of the limitations of the base claim and any intervening claims. In view of the above amendments and arguments, it is respectfully submitted that claims 53 and 56 are presently in condition for allowance.

CONCLUSION

In view of the foregoing amendments and remarks, Applicants respectfully submit that the above amendments place the present application in condition for allowance and/or better form for appeal. Entry of this amendment, reconsideration of the present Office Action, and an early Notice of Allowance are respectfully requested.

ABI-0009

PATENT

Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached pages are captioned **“VERSION WITH MARKINGS TO SHOW CHANGES MADE.”**

Date: 1/8/03

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Respectfully submitted,

A handwritten signature in dark ink, appearing to read "Michael K. Jones", is written over a horizontal line.

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

The claims have been amended as follows:

21. **(Twice Amended)** The system of claim 1, further comprising

a conduit assembly having a plurality of conduits for separately channeling a plurality of submillimeter beads released from said cavities to desired locations on a substrate, said conduits having (i) [large] first openings at their upper ends disposed in an array having a center-to-center pitch like that of the projection array such that the [large] first openings are substantially alignable under the projections, and (ii) [small] second openings at their lower ends disposed in an array having a center-to-center pitch like that of the substrate array such that the [small] second openings are substantially aligned thereover.

22. **(Amended)** The system of claim 21, wherein said [small] second openings are disposed in an array having a center-to-center pitch substantially smaller than that of the [large-opening] first-opening array.

23. **(Amended)** The system of claim 22, wherein the center-to-center pitch of the [small-opening] second-opening array is reduced by a factor of at least about 3, as compared to that of the [large-opening] first-opening array.

24. **(Amended)** The system of claim 21, wherein said substrate is a micro-card having a plurality of wells disposed in an array alignable under said [small-opening] second-opening array.

51. **(Amended)** The system of claim 21, wherein each of said conduits is curved along a longitudinal direction from said [large] first opening to said [small] second opening.

54. **(Amended)** The system of claim 21, wherein said substrate is provided with a pair of spaced-apart indexing holes, each being aligned with a respective indexing pin depending from a lower side of said conduit array; whereupon registering said indexing pins in said

indexing holes substantially aligns said [small-opening] second-opening array with said well array of said substrate.

55. **(Amended)** The system of claim 21, further comprising a detection system having a field of view extending into each of said conduits, and adapted to sense the presence or absence of a bead on said substrate under each of said [small] second openings.

56. **(Amended)** The system of claim 55, wherein said detection system further comprises:

a radiation source adapted to illuminate said substrate at locations below each of said [small] second openings; and

a plurality of elongated light-conductive fibers, each fiber having (i) one end disposed to receive light traveling up through a respective conduit, and (ii) a second end that communicates with a camera device.

57. **(Amended)** The system of claim 21, further comprising a support structure, wherein said [large] first openings are disposed in an array along one side of said support structure, and said [small] second openings are disposed in an array along an opposite side of said support structure, wherein said [large-opening] first-opening array is arranged with a center-to-center pitch larger than that of said [small-opening] second-opening array, and wherein a region of each conduit extending from a respective one of said [small] second openings is of capillary size, such that a liquid placed in contact with said [small-opening] second-opening array can be drawn at least partially into said conduits by way of capillary action.